Milton's Plants in *Paradise Lost*

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It would be a good thing to have a garden where Milton's plants and animals are kept. We have already botanical gardens of Man'yōshū : A Collection of a Myriad Leaves and of Shakespeare; we have no Milton's either here or in the other countries, if my recollection is correct. We have not even Milton's plants in book; we admire *The Flowers of Shakespeare* compiled by Doris Hunt (Webb & Bower, 1980) and *Wordsworth's Flowers*, by Stanley Finch, illustrated by Muriel Harrison (Lunesdale Publishing Group Ltd, 1982) which I bought in Great Britain. But, for some reason or other we have no *Milton's Flowers* either here or elsewhere. Not that Milton disliked flowers; far from it, he sublimed the idea of flower to that in Heaven:

> lowly reverent
> Towards either Throne they bow, and to the ground
> With solemn adoration down they cast
> Thir Crowns inwove with Amarant and Gold,
> Immortal Amarant, a Flour which once
> In Paradise, fast by the Tree of Life
> Began to bloom, but soon for Mans offence
> To Heav'n remov'd where first it grew, there grows,
> (*Paradise Lost*, III, 349–356)

It would not be wrong to expect the Milton's ideal botanical garden in Heaven.

One reason why I am compiling Milton's plants is that we may get some clue to Milton's notion of Paradise on the earth, the Garden of Eden through their distribution and taxonomy. This is through genuinely botanical interest. It is true that Milton's knowledge of plants was limited; but this limit is no hindrance to our aim. His botanical knowledge may suggest some useful facts about the geography of Eden. To this end, we have a lot of works, for example, if we can locate the place of genesis of one species of a plant, it would give a great clue to the mystery of the origin of life. Some botanists are

working for this field though not with such a metaphysical aim as we have, but with academic attitude.

I hope this botanical groundwork of Milton's plants will eventually prove to be a step for building Milton's garden not in Heaven but on the earth in the near future.

I must give thanks to Dr. Hedge at the Royal Botanic Garden in Edinburgh for his affording every facility for us to use the library to the Garden; to Dr. Robin Dunbar for introducing us to the Garden; lastly, to my wife Keiko, a botanist who wrote down every necessay descriptions of the plants in the library.

The descriptions are all extracted from:

The New York Botanical Garden illustrated, *Encyclopedia of Horticulture*, ed. by Thomas H. Everett.

The Royal Horticultural Society Dictionary of Gardening ed. by Chittenden, O. B. E., Filis, V. M. H.

Hortus Third; A Concise Dictionary of Plants Cultivated in the United States and Canada, by the Stuff of the L. H. Bailey Hortorium, Cornell University.

I do hope they will forgive me for my using these descriptions from these books.

English name	Scientific name	Genus	Family
Pine	Pinus resinosa Ait.	Pinus	Pinaceae
	(Red Pine)	(Pine)	
	(Canadian red pine)	(70 species)	

The genus *pinus* of the pine family Pinaceae, is the most important one of the great group of plants called conifers. It also contains the most species, upward of a hundred.

The natural distribution of pines is confined almost entirely to the northern hemisphere.

Pines are predominantly inhabitants of temperate and warm temperature climates.

The red pine (P. resinosa) is also called Norway Pine. This suggests alien origin, but the Norway to which reference is supposed to be made in a village in Maine, not the European country. Native from Newfounland to Manitoba, Pennsylvania, and Minnesota.

The generic name is an ancient Latin one,

Pines are handsome, evergreen, resinous trees with branches usually in whorls (tiers) and needle-like leaves. Decidedly ornamental tree.

P. resinosa occasionally attains a height of 150 feet, but more usually does not exceed

70 feet. It has reddish-brown bark and a broad, pyramidal head of spreading sometimes dropping branches.

Its glossy-green; flexible leaves, in pairs, are up to 6 unches long, the longest of any pine native in northern North America, in pairs lasting 4 years.

Their primitive flowers are unisexual with both sexes on the same tree. The males are located at the base of the new shoots in yellow, orange, or red, catkinlike clusters. They produce pollen so abundantly that if a branch bearing ripe flowers is shaken it is distributed in sulfur-yellow clouds. The female flowers are in structures that usually develop at or near the shoot ends, or more rarely, at irregular intervals along young shoots.

These structures become the familiar cones containing the seeds. The flowers of pines are flowers in a technical sense only. Females consist only of ovules, two to each cone scale, males of anthers only, also two to each scale. The ripe pollen is dispersed by the wind.

Its nearly stalkless, ovoid cones are 1 1/2 to 2 1/2 inches long and without pickles.

Propagation is by seed.

As young trees, pines are almost always symmetrical and pyramidal, but with age many develop highly picturesque crowns, and with wide-spreading branches.

Geologically, pines are an ancient group. They first appeared in the Mesozoic, more than 60,000,000 years ago, but did not become dominant factors in the major floras of the earth until the end of the Tetiary, less than 1,000,000 years ago. Since, they have been highly successful in competition with other plants and are believed to be still advancing southward. In many regions they form continuous, one species forest, in other areas they grow in scattered groves or as individual trees intermixed with other kinds, or alone. The oldest living thing is possibly a pine.

The usefulness of pines extends far beyond their importance as ornamentals. They serve industry im many ways and are esteemed for forestry planting.

They are sources of lumber, plywood, pulpwood, turpentine, rosin, pitch, tar, and essential oils.

His Spear, to equal which the tallest *Pine*
Hewn on *Norwegian* hills, to be the Mast
Of some great Ammiral, were but a wand,
He walkd with, to support uneasie steps
Over the burning Marle, not like those steps

On Heavens Azure;

(Italics are added.) *Paradise Lost* I, 292-97

English name	Scientific name	Cenus	Family
Sedge	Carex pendula Huds	Carex (2000 species)	Cyperaceae

Possibly two thousand species of sedge family Cyperaceae constitute the genus Carex. Carex pendula is a native of damp wood and shady places near water usually on clayey soils in south Europe including Britain, North Africa, and Western Asia.

The name carex came from the Greek *keiro*, to cut. The allusion is to the minutely saw-toothed leaf edges, which in some kinds are sharp enough to cut a hand they are drawn swiftly across.

Carex pendula is grasslike herbaceous perennial. This specie is recognized by its large size, broad leaves and long drooping spikes. It is very graceful. But it differs from grasses in having solid triangular stems (those of grasses are round and hollow), leaves in three ranks instead of two and monoecious flowers in spikes.

Stems 3 to 6 feet high tufted, from stout rhizomes, nodding at the top.

Lower leaves are bladeless, forming sheaths that completely surround the stems, browish-red. Upper leaves with yellowish green blades shorter than the stems, 1/2 to 4 inch long, are of male flowers, the lower spikes are of female, in widely-spaced pendulous and 2 3/4 to 6 inches long. Its black flower-head are showy when bursting and afterwards they assume a brown colour. They are without sepals or petals. The males have three stamens, the females a solitary pistil, with two or three styles. Flowering period is spring to autumn.

They are very readily increased by division or seeds sown in the autumn.

They are mostly of no horticultural importance.

he stood and calld
His Legions, Angel Forms, who lay intránst
Thick as Autumnal Leaves that strow the Brooks
In *Vallambrosa*, where th' *Etrurian* shade
High overarcht imbower; or scatterd *sedge*

Afloat, when with fierce Winds *Orion* armd
Hath vext the Red-Sea Coast,
(Italics are added.) *Paradise Lost*, I, 300-306

English name	Scientific name	Genus	Family
Amaranthus (Amaranth)	A. tricolor L. (Variety of A. tricolor) (Joseph's coat)	Amaranthus (50-60 species)	Amaranthaceae

Only a few of the sixty vigorous and often coarse annuals that constitute Amaranthus is the amaranth family Amaranthaceae.

Amaranthus are mostly natives of tropical, subtropical, and warm temperature regions and occur in many parts of the world.

Most are too weedy to be garden plants, but among those cultivated are such popular kinds as love-lies-bleeding, prince's feather, and Joseph's coat.

The name of the genus is from the Greek *amarantos*, unfading, in allusion to the lasting qualities of the flower parts.

The gaity-colored foliage plants that include the kind known as Joseph's coat are varieties of the very variable A. tricolor, a native of the tropics.

They are erect, mostly freely-branched, 1 foot to 4 feet tall.

Leaves are highly colored, alternate, stalked, lobeless. They are irregularly splashed with several colors including green, yellow, orange, carmine, crimson and purple.

Flowers are red and are in small, spherical clusters in the leaf axils, or in the upper parts of the plant form narrow, panicle-like clusters. They are not showy. They are without petals, but have three to five persistent sepals, three chaffy bracts, and two to five stamens and two or three stigmas.

Fruits are small and bladder-like, technically utricles.

They are important or ornamentals invaluable for creating tropical and subtropical effects of rare splender. They may be used to equally good purpose in coach and window boxes as in beds and borders.

lowly reverent
Towards either Throne they bow, and to the ground

With solemn adoration down they cast
Thir Crowns inwove with *Amarant* and Gold,
Immortal Amarant, a Flour which once
In Paradise, fast by the Tree of Life
Began to bloom, but soon for Mans offence
To Heav'n remov'd where first it grew, there grows,
And flours aloft shading the Fount of Life,
(Italics are mine.) *Paradise Lost* III, 349-57

English name	Scientific name	Genus	Family
Tree of life (Western arbor-vitae) (Western red cedar) (Giant arbor-vitae) (Giant cedar)	Thuja plicata J. Donn ex D. Don	Thuja (5 species)	Cupressaceae (Pinaceae)

There are only five species of Thuja, but the horticultural varieties of some kinds are so numerous. The genus name arbor vitae means tree of life, T. plicata, as it is sometimes called, the western arbor-vitae, or western red cedar, or giant arbor-vitae, or giant cedar, is indigenous from Araska to Northern California and eastward to Montana (western N. America). Thrives in most parts of British Isles where soil conditions are suitable.

Well deserving its common name, T. plicata towers a majestic column or narrow spire of greenery, up to 200 feet in height. Its massive trunk covered with cinamonred bark and sometimes 12 feet in diameter, is heavily buttressed.

Coniferous, evergreen, monoecious large tree. It is pyramidal and densely branched and foliaged when young. Later it develops as tall pyramidal or columnar trees.

Branches flexible, horizontal or pendent, branchlets flattened, lying in the same plane as branches, segments finely divided.

Leaves are closely pressed, the tiny, scalelike when young needlelike. The upper sides of the scalelike leaves are rich, lustrous green, about 1 1/4 inch long, with oil or resin gland on back, their undersides about 1/8 inch long, without conspicuous glands and distinctly marked with white.

It is bisexual with male and female flowers on different blanchlets of the same tree. The males at the bases of the shoots, the females from small terminal branchlets.

The fruiting cones are 1/3 to 1/2 inch long, erect and green when young, drooping and

brown mature. They each have 10 to 12 pairs of scales, of which the three center pairs usually produce seeds.

Seeds 2 to 3 on each fertile scale, 1/4 inch long, thin winged.

Propagation is by seeds sown in beds of fine soil out of doors.

One of the most effective evergreen trees in moist trees in moist soil with some shelter from violent winds. Grows rapidly and forms a good screen.

Also the soft, durable wood is an important trees in the Pacific Northwest. The wood is in demand for greenhouse benches, shingles and siding, closet linings, and general carpentry, as well as for poles and fences.

Long ago white man came to North America, the Indians of the northwest employed planks of it to build their huts and carved toten poles from its trunks.

Thence up he flew, and on the *Tree of Life,*
The middle Tree and highest there that grew,
Sat like a Cormorant;
(Italics are mine.) *Paradise Lost,* IV, 194-96

English name	Scientific name	Genus	Family
Myrtle (Common myrtle)	Myrtus communis L.	Myrtus	Myrtaceae

Of the 100 or so species of Myrtus, the best known is common myrtle (Myrtus communis). The "common" myrtle, as it is called, is very wildly distributed of lands surrounding the Mediterranean.

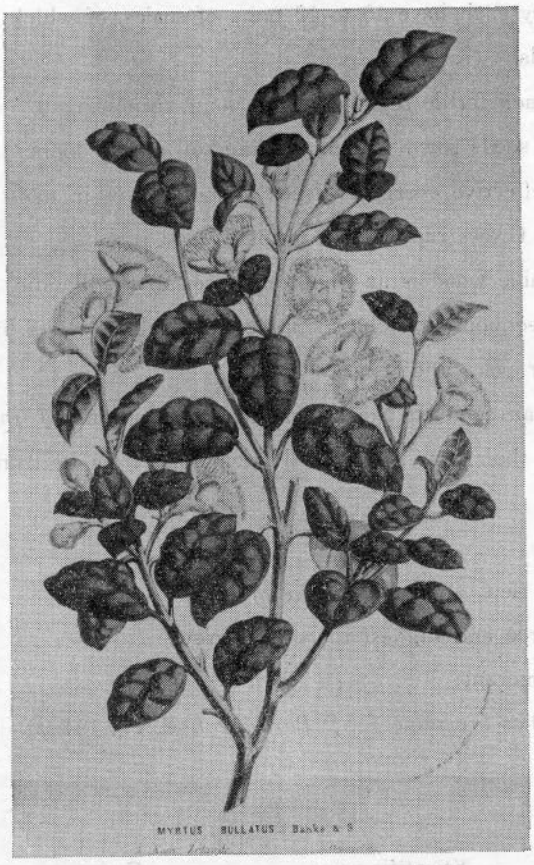
It is a very beautiful evergreen shrub varying from 3 to 12 feet in height and very fine sweetly perfumed. They produces flowers in abundunce during summer.

Leaves are ovate to lanceolate 1 to 2 inch long, densely, toothless, opposite, dark lustrous green, fragrant, when bruised.

Flowers are pure white, fragrant, four spreading petals, borne singly in the axils of leaves, numerous stamens longer than the petals.

Fruits are ovoid to spherical, purple black berry, containing several kidney-shaped seed.

The common myrtle has been esteemed since classical times as a symbol of love and peace. The ancients dedicated it to the goddess, Venus and decorated magistrate, poets,



playwrights. The Greeks wove their wreaths that they placed upon the heads of their champions.

It is the myrtle of Bible, still used by Jews in connection with the feast of the Tebernacle.

Today it is valued for the fragrant of its leaves and its sweet-scented flowers. It is useful for foundation plantings and spread hedges. They also are excellent for tubs and other containers used to decorate terraces patios steps, and other architectural features, and for espaliering against walls.

mean while murmuring waters fall
Down the slope hills, disperst, orin a Lake,
That to the fringed Bank with *Myrtle* crownd,
Her crystal mirror holds, unite thir streams.
(Italics are mine.) *Paradise Lost*, IV, 260-63

Milton's Plants in *Paradise Lost*

English name	Scientific name	Genus	Family
Platan (Platanus)	P. acerifora Willd (London Plane)	Platanus	Platanaceae

Species of Platanus are so familiar to each other and so different from all other trees that botanists group them in a family by themselves, the plane family Platanaceae. There are 6 or 7 species all native of the northern hemisphere. The plane trees have been parts of the Earth's flora for at least 100,000,000 years.

The London plane (P. acerifolia) is probably more familiar to residents of cities in the temperature regions than almost any other trees. It has been planted in vast numbers in London, Paris, New York and countless other urban communities around the world, and everywhere it endures difficult environments, minimal care, and drastic pruning better than almost any other tree. Yet the origin of the London planes is not surely known. It grows nowhere in the wild. But there can be no reasonable doubt that it is a fertile hybrid between the eastern American buttonwood (P. occidentalis) and the oriental plane (P. orientalis) that originated in Europe before 1666. It is much more likely that Portugal or Spain was the birthplace of London plane. Be that as it may, the London plane is intermediate in all respects between its supposed parents.

The name is derived from platanos, the Greek name of the oriental plane, in allusion to the broad flat leaves.

A very characteristic feature is scaling bark. The outer covering of the trunk and larger branches peels in big patches, exposing smooth new surfaces lighter colored than the older parts. This gives a more or less piebald appearance to trunk and limb. This is a magnificient deciduous large tree, it attains a maximum height of about 150 feet, with a tall, clean trunk of great bulk, bark freely scaling in late winter. It has a single trunk, a broad, round head, and somewhat dropping lower branches.

Leaves are alternate, large and simple. They are 3-5 lobed, lobes about 1/3 as long as blade, 5 to 10 inch wide. The lobes are triangular sparsely but coarsely toothed. They have long stalked, stalks up to 4 inch long. The bases of the leafstalks completely conceal the axillary winter buds, fitting over them like a candle snuffer over a candle flame.

The minute unisexual flowers are in quite large, dense, spherical heads attached the pendulous stalks. The heads of flowers are either completely male or female, with both sexes on the same tree. Bloom in spring.

Fruits obconical, angled, 1-seeded nutlets densely packed in spherical balls, some solitary but more often 2 to 6 strung on a slender pendulous stalks, often persiting after the leaves

have fallen. Balls, 1 to 1 1/2 inch wide.

Propagation is by seeds and cutting, layering and the cultivators sometimes by grafting.

They are primarily subjects for parks, parkways, and other large-scale landscape development and as street trees.

This is the most popular of all trees in London and none withstands the atmospheric conditions better.

What could I doe,
But follow strait, invisibly thus led?
Till I espi'd thee, fair indeed and tall,
Under a *Platan*, yet methought less faire,
Less winning soft, less amiablie milde,
Then that smooth watry image;
(Italics are mine.) *Paradise Lost*, IV, 475-80

English name	Scientific name	Genus	Family
Laurel	Laurus nobilis L. (Laurel) (Sweet bay) (Bay laurel) (Royal bay)	Laurus (2 species)	Lauraceae

The genus Laurus belongs to the Laurel family Lauraceae and consists of two species.

Laurus nobilis is native of Mediterranean region. Elsewhere in Mediterranean-type climates, where mild winters and warm summer, L. nobilis (sweet bay) prevails.

Laurus is ancient Latin name of leafy shoots.

Sweet bays are medium-size, evergreen trees not hardy in the north, that under foverite conditions attain heights of 50-60 feet, but often lower.

They are aromatic, 1-sexual trees, pyramidal, very leafy and often with suckers at base.

Leaves are alternate, simple, hairless, lanceolate to oblong. Dark shining green, 2 to 4 inch long, short-stalk 1/8 to 1/3 inch long, lobeless, leathery. When crushed they are strongly and pleasantly aromatic.

The folwers, with the sexes usually on separate trees, are produced in spring. They are small, greenish-yellow, axillary umbels, inconspicuous, no display value. The blooms have

4-lobed calyxes, no petals. The males have four aborted stamens or staminodes and one style.

Fruits are globose, shining black, 1/2 inch long, cherry-like in appearance, technically berries, spherical to slightly egg-shaped.

Propagated mostly by cuttings of ripened wood under glass, and sometimes by seed.

By the ancients sweet bay was held sacred to Apollo and was favored for planting near temples. From leafy shoots of this, the Romans fashioned wreaths to crown victors. From this ancient custom derives our ward, bacculaureate (from *bacca*, a berry, and *laurens*, of laurel) as well as the English *poet-laureate*, and, by modification the word bachelor. Doctors upon passing final examinations were similarly decorated with berried branches of the same species.

Now the sweet bay is a fine ornamental evergreen for general landscaping, screening hedge, backgrounds, and such like uses. It withstands considerable frost and can be sheared to almost any desired size and shape. Because of this adaptability it has long been favored for growing in large tubs and other containers for decorating steps, terrace, patios, and similar areas.

Leaves are aromatic, used in condiments of cook (bay leaves). Berries are in veterinary medicine.

Thus talking hand in hand alone they passd
On to thir blissful Bower; it was a place
Chos'n by the sovran Planter, when he fram'd
All things to Mans delightful use; the roofe
Of thickest covert was inwoven shade
Laurel and Mirtle, and what higher grew
Of firm and fragrant leaf;
(Italics are mine.) *Paradise Lost*, IV, 689-95

English name	Scientific name	Genus	Family
Acanthus	Acanthus mollis var. latifolius (Acanthus spinosus var. spinossimmus)	Acanthus (20 species)	Acanthaceae

This genus is commonly known by the name of Bears' Breech. It belongs to Family

Acanthaceae and has 20 species. Generic name is from the Greek *akantha*, a spine. It refers to the prickle-toothed edges of the eaves of some kinds.

Acanthus are stately plants grown for the decorative appeal of their ornamental foliage as well as for their attractive blooms. So, they are rarely seen in gardens.

The simple beauty of acanthus leaves inspired the ancients to conventionalize their forms as decorations for the capitals of Corinthian and other colums. It is thought that these architectual embellishments are based on the foliage of A. spinosus and A. mollis var. latifolius.

Leaves are basal, reach upward and arch outward in almost fountain like fashion, radical.

Flowers are showy and in stiffly-erect spikes up to 18 inch and subtended by large leaflike spine-tipped bracts. Numerous clustered flowers form spikes. Corolla consits of abroad tube and one large three lobed lip. Calyx is 4-lobes, 2 lobes smaller than other 2. Stamens with hairy anthers are four thick-stalked.

Fruits have four-seeded capsules, each 2-celled caps, seeds 2 in a cell.

Propagated by seeds or by division. They do best in rich well drained soil.

A mollis var. latifolius (a variety of spinosus). This attains 5 to 6 feet tall. Leaves are larger, gracefully and dropping of rich glossy green long foliage. They are wavy margins, less deeply lobed, not spiny, heart shaped. Spikes have white or pink blooms.

A. spinosus var. spinosissimus (a variety of spinosus). This is difference of the above species. It attains 3 to 4 feet tall. Leaves have the margins of deeply pinnately-cut. There are lanceolate, each division, each division spiny. Flowers are purplish.

For the beauty and graceful dignity of its form was quickly appreciated by the ancient workers in marble and when the earlier orders of architecture had progressed from the rude and massive Doric to the stately Ionic, and when this had led to the more graceful and high ornate Corinthian and the still later Composite, in the two latter orders it was the Acanthus foliage that gave its form to the richly chiselled ornament of frieze and architrave and much else of ornamental detail on many a building or other object of public dignity or domestic utility.

And again, in the Middle ages, the beauty of the Acanthus is recognized, and its ever-recurring form runs through all the best of the ornament of Italian Renaissance. In marble, in bronze and iron in delicate working of silver and gold, in cunningly carved wood-woodwork of throne, choir-stall, and canopy, and in every detail of the interior of palatial dwelling, of municipal buiding or of vast cathedral; wherever ornament rightly applied

grew out of structure—not only in marble, wood and metal, but in painting and pottery and in woven fabric—the noble lines and forms derived from the Acanthus grew and throve, conceived in adaptation of suitable use by the brain of the artist, and wrought in the same spirit by the sympathetic hand of the craftsman.

Today, as garden ornamentals in regions of moderately mild winters acanthus serves rather specially because of the ornamental qualities of their folige as well as the dignified, if muted, values of their displays of bloom. The larger ones are well adapted for associating with architectural features and are seen to good advantage near walls, steps, and the like, and on terraces. They are also admirable for lawn beds and other isolated groupings and for massive boldly on banks and other places where their splendid leaves show to good effect.

On either side
Acanthus, and each odorous bushie shrub
Fenc'd up the verdant wall;
(Italics are mine.) *Paradise Lost*, IV, 695-98

English name	Scientific name	Genus	Family
Iris	Iris pseudacorus L. (Yellow flag) (Walter flag)	Iris Fleur-de-lis	Iridaceae

Iris is Iridaceae. It comprises some 300 species plus untold thousands of varieties and hybrids of the most popular. As natives, irises are found in most parts of the northern hemisphere.

I. pseudacorus, the yellow flag is native of Europe, North Africa. But wide spread in wet areas.

It is an ancient Greek one, given according to Dioscorides, because of the resemblance of its flowers to the "rainbow in heaven."

Roots: rhizome pink inside.

Stems: branched stems are erect. 2 to 3 feet high; stout, terete, forked low down.

Leaves: longitudinally-parallel-veined; broadly sword shaped, two-ranked; 2 to 3 feet long (about as long as stems); 1 inch wide; ensiform; glaucous.

Flowers: veined violet; showy; large; nearly erect; almost scentless; clustered; three petal-like sepals called falls, spreading, reflexed, or pendulous, and often arched banner petals known as standards; the branched flower stalks equal or exceed the foliage in height. Each has several bright yellow blooms with falls about 2 inches long.

Fruits: many seeded six-angled, oblong-capsules.

Irises are garden and landscape staples. The great uses of irises are in beds and borders, either alone or in combination with other herbaceous perennial and annuals, and especially beardless and crested sorts, for planting informally in more naturalistic surroundings.

Interests in irises goes back beyond recorded history. Four millennia ago kings and priests of Crete acknowledged its flowers as their own, and the "lilies" of certain biblical references were irises. The ninth-century German monk and writer on theology Walafried Strabo, in his poem "Hortulus" tells of growing I. germanica in the little garden he carefully tended. This kind was cultivated in many other monastery gardens then and later because its rhizomes as orris root were esteemed as medicines. They were employed to induce sleep, cure ulcers, and alleviate the sad affliction of a "pimpled or saucie face."

About 1147, Louis VII of France, following his excommunication from the church, engaged in a crusade against the Saracens. As the story goes, he chose as his emblem an iris, which become known as the fleur de Louise, later corrupted through fleur de luce and fluer de lys to fleur de lis, the heraldric emblem of France, his choice was inspired, it is said, by the legend that 600 years earlier Clovis, king of the Franks, had adopted as his devise I. pseudacorus. This, some say, because his observation of its yellow blooms far out in a river revealed the waters were shallow enough to ford and so permit him and his men escape annihilation by a superior army of pursuing Goths. Others attribute his choice to, the story that being face, with defeat in battle, he a pagan, prayed to the God of his Christian wife, defeated his enemy, and in gratitude replaced the three toads of his banner with three iris blooms, flowers dedicated to the Virgin.

each beauteous flour,
Iris all hues, Roses, and Gessamin
Reard high thir flourisht heads between, and wrought
Mosaic; underfoot the *Violet*,
Crocus, and *Hyacinth* with rich inlay

Broiderd the ground, more colourd the with stone
Of costliest Emblem:
(Italics are added.) *Paradise Lost*, IV, 697-703

English name	Scientific name	Genus	Family
Violet	V. odorata L. (Sweet violet)	Viola (Violet)	Violaceae

The name genus of the violet, family Violaceae, this includes pansies and violets. Three are about 400 main species many having several subspecies and varieties. They are widely distributed over the north and south temperate zones. Visitors to northern Europe are invariably impressed with the splendid displays of magnificient violas presented throughout the summer in parks and gardens there.

V. odorata, the sweet violet is native of Europe, N. Africa, Asia. This is best known species, since it has long been important as a source of perfume and is in the florist trade. It has a number of garden forms.

The name comes from the Greek *ion*, earlier wionm, a violet.

They are mostly perennial herbaceous and stemless. They form rosette-like tuft of foliage and sends out slender long runners (stolons) that root from their tips to give to new plants. Up to about 2 inches long.

Toothed, the round to kidney-shaped leaves with heart-shaped bases are up to about 2 1/2 inch wide, long stalked.

Showy flowers are fragrant, about 3/4 inch across. Petals are deep violet, rarely rose or white. They are nodding, and have five sepals and five petals, the lower petal usually larger than the others and with a short spur at its base. The other petals form two dissimilar pairs. There are five often dissimilar stamens and one style. February to April.

Two kinds of flowers are produced, the showy, familiar ones of spring, which produce few or no seeds, and scarecely noticeable, petal-less summer blooms, near or even under the ground, that are without petals, don't open, are self fertile, and produce abundant seeds.

Fruits are a many seeded capsules, dehiscing into 3 boat-shaped, keeled valves.

Propagation is easy by seed and this is usually increased by offsets. Sweet violet is one of most fragrant wilde plants, and is common in woods, in hedges, amongst bushes, and on warm banks.

For many years the cultivation of the sweet violet has been a market-garden industry, and great quantities are grown in southern England for marketing in London and other big cities.

The many hort. forms vary in stature, size and color of flowers and some have double flowers.

Also they are provided with an appendage attractive to ants.

English name	Scientific name	Genus	Family
Crocus	C. vernus J. Hill (C. sativus L.)	Crocus (75-80 species)	Iridaceae

Crocus is the iris family Iridaceae and a genus of hardy bulbous plants. There are seventy-five species.

As mild plants corcuses are found from the Mediterranean region to Afghanistan.

For convenience crocuses are divided into two groups, those that bloom in winter or spring and those that bloom in the summer or fall.

The name crocus is the ancient Greek one for saffran. (The name crocus is a Chaldean name, applied by Theophrastus.)

Crocus is cormous herbs. There is no above-ground stem, the flowers rise directly from the earth. The apparent stem is part of the slender corolla tube. Scapes enveloped in a thin tubular sheath.

They have glasslike linear leaves that come with or after the blooms, if with them, they continue to lenghten after the flowers fade. Keeled. They, white and almost all colors except red, have six petals (segments), nearly equal as a rule. The ovary is below the petals. Three stamens not united, arising from the perianth tube, including in the tube and one style with three stigmas. Perianth tube long and slender.

Fruits are small, usually oblong, capsules, hidden among the leaves either at or just below the ground surface.

Crocuses don't have bulbs. The organs that look like them are technically corms. Unlike bulbs, which are composed of concentric layers of scales as are onions, or of scales arranged like shingles on a roof as are lily bulbs, corms are solid. The planted corm shrivels and is replaced by the time the flowers and foliage fade by one or more new corms. This is repeated yearly.

C. vernus J. Hill (Dutch crocus)

Its native alpine haunts. Europe. Spring-blooming crocuses of quite gorgeous garden varieties, mostly developed by industrious Hollanders and consequently often called Dutch crocuses, are among the best known garden plants.

A species showing great range of garden as well as wild varieties.

Flowers: in the wild its blooms are lilac or white, often striped with purple. The stamens have white stalks and lemon yellow anthers, and the branches of the style are orange-red. But in the size of bloom and range of flower color the Dutch crocuses go far beyond the relative modesty of C. vernus. Tube 3 1/2 inch, throat wide within beared, segms 1/2 to 2 inch or more long, 1/3 to 1 inch broad. Early spring (February to April).

Leaves: 3 or 4 with flowers, 12 to 14 inch long 1/3 inch broad with white line.

C. sativus L. (saffran crocus)

Crocuses that bloom in fall are perhaps less thrilling but not less beautiful than those of late winter and early spring.

One, the source of saffron, has been cultivated in Europe and Asia since the times of the ancient Greeks and Hebrews. In the Bible saffran is preferred to, together with spikenard, calamus, and cinamon. This is believed to have originated in Asia Minor. Italy to Kurdistan. It appeares to have been cultivated in Palestine at the time of Solomon.

Leaves: 6 to 8 with flowers, 15 to 18 inch long 1/12 inch wide, margins ciliate.

Flowers: fragrant large tube 4 inch long. Throat purple, bearded; perianth segms spreading 2 inch long, 3/4 inch broad, bright lilac purple towards the base, purple vained. stigmas long and drooping, entire scarlet, the source of the saffran of commerce.

Corm rather large, globular, depressed.

A beautiful yellow due and spice, it is readily soluable in water and much used for coloring for foods and flavoring curries and other foods and in liqueurs and medicines. It is obtained from the stigmas and ends of the styles of the flowers. Those from about 4000 blooms are required to yield an ounce of the due.

Generally represented in our garden by about a dozen species, and the innumerable varieties of Dutch crocuses.

Many of the species will grow well in the rock garden, in soil that has a good proportion of small stones intemixed, thereby insuring thorough drainage.

English name	Scientific name	Genus	Family
Hyacinth	H. orientalis L. (Common hyacinth)	Hyacinthus (1 species)	Liliaceae

The genus Hyacinthus, of the lily family Liliaceae, as now interpreted consits of a single species.

Native of the Mediterranean region, Asia Minor, and Syria.

Its name is its ancient Greek name used by Hormer and others, the flower being said to spring from the blood of the dead Hyakinthos.

It is best known to gardeners for its magnificient horticultural varieties, the sources of the massive, obese spikes of heavily-scented blooms that stood stiffly to attention in serried rows in old-fashioned spring flower beds in parks and private gardens of the past. The decline of interest in formal bedding as well as its high costs have sharply reduced the number of such displays, but the same hyacinths—Dutch hyacinths as they are called—are still favorite for forcing into bloom as Eastern pot plants and for planting in gardens although less lavishly than formerly.

Propagation of hyacinths is by means of bulblets or offsets from the old bulbs, which should give blooming bulbs in 2 or 3 years.

Hyacinthus have all basal narrow leaves and erect stems with spikelike cylindrical racemes of blooms that my be white, pink, red, blue, purple, or yellowish.

They have normally six petals that are spreading or reflexed, six short stamens attached to the inside of the corolla, and a solitary pistil (bulb tunicate) (perianth funnel form with cylindrical tube).

Fruits are three-angled or three-lobed dry capsules. Seeds carunculate, black, 8-12 inch each all.

The common hyacinths (H. orientalis) is native from Greece to Syria and Asia Minor.

Little known in its mild form, as such it is more graceful than its garden varieries. Its bulb are large and approximately globular, bulb tunics whitish or purplish; its leaves are 4-6 inch, fleshy, strap-shaped, and 1 ft long or more, 1 inch wide or wider, with upturned margins; its hallow stalks carry many nodding or horizontally-held, sweetly scented blooms that come in a variety of colors and are about 1 inch long.

Pictures of horticultural varieties of this hyacinth confront us in brilliant color from the pages of cataloges of spring bulbs.

Garden varieties of the common hyacinth are so well known it would waste space to list and detail the characteristics of the named entities here, sufficient it to say that they may

be had in all the colors mentioned earlier and in many shades and tones of each.

They are most satisfactory plants to fill spring flower beds.

Biritish gardeners developed the practice of intermingling with hyacinths other plants such as pansies, English daisies, and polyanthus primroses.

The wild form is a very graceful plant perhaps not now in cultivation.

The florist's forms which are commonly understood as Hyacinths are derived from *H. orientalis* and its variety *provincialis.*

They are largely imported from Holland though recent experimental work has shown that first class bulbs or their special purposes can be and are now grown in certain districts of England.

English name	Scientific name	Genus	Family
Citron	C. medica. L.	Citron (16 species)	Rutaceae

Orange, Lemon, Shaddock, Grapefruit, Lime, Citron, the fruits of several members of the genus Citrus of the rue family Rutaceae are so familiar that the generic name has become a household word. Even the non botanical know them as citrus fruits. The numbers of species is probably about sixteen. Native to southern and southeastern Asia and Indonesia, citruses are naturalized in warm regions elsewhere. Several cultivated kinds generally recognized as species no longer exist in the wild and perhaps never did.

Citron (C. medica) is native of Asia. Cultivation in southeast Asia, Medit. regions and West Indies. Much grown in Corsica.

From the Greek name kitron.

Citron is a large thorny shrub or small trees. Evergreen, branching irregular, to 10 feet; stout, stiff.

Leaves are alternate, undivided, thick. Leaflets are minutely-gland-dotted. When crushed are aromatic. 4 to 7 inch long. Oblongish and toothed. They have stalks without wings.

Flowers are very fragrant, large, bisexual. They are in clusters from the leaf axils or panicles. Four to five-lobed calyxes. Five petals. White with purplish outsides. 1 1/2 inch wide or wider. Thirty or more stamens.

Fruits are very thick-rind. They are known to botanists as hesperidiums. Rough, often lumpty, fragrant skins. Oblong-ovoid to nearily spherical. When ripe are lemon-yellow.

They contain only small amount of acid pulp (white) and up to 10 inch long.

Propagated by seeds and subsequent grafting of selected stock onto the seedling.

They are esteemed for eating as taken from the trees, for making marmalades, for juicing, for flavoring. The peels are candied and used in confectionary and cakes. They are important of commerce. They are also useful in the home garden for fruit or ornament.

Citron was brought into cultivation in the Mediterranean region about 300 B. C. by the armies of Alexander the Great, and there the method of candying its peel was discovered.

C. Medica var. Ethrog Engl. (a variety of citron) fruits fragrant size of a lemon, but more elongate: used by people of the Jewish faith in ceremonies associated with the Feast of Tabernacles.

Jewish sacred citron is Ethrog.

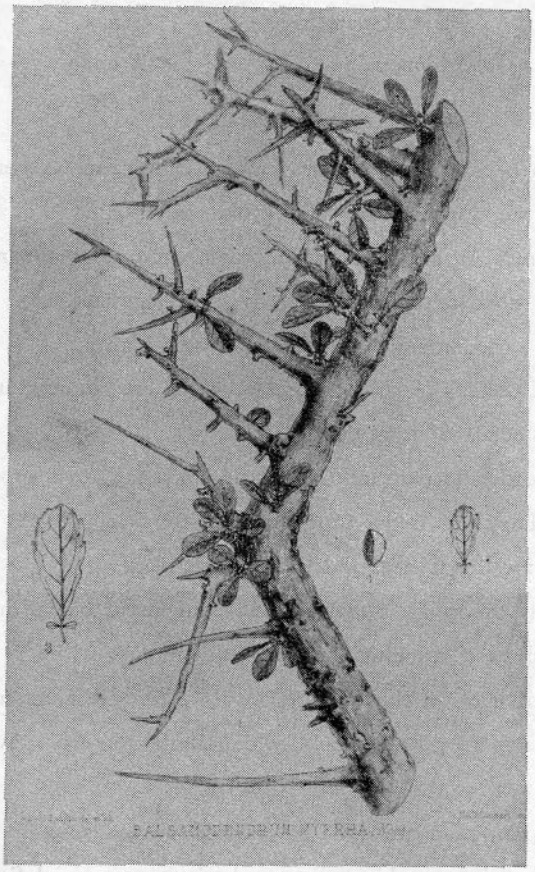
> My fairest, my espous'd, my latest found,
> Heav'ns last best gift, my ever new delight,
> Awake, the morning shines, and the fresh filld
> Call us; we lose the prime, to mark how spring
> Our tended Plants, how blows the *Citron* Grove,
> What drops the *Myrrhe*, and what the balmie *Reed*,
> How Nature paints her colours, how the Bee
> Sits on the Bloom extracting liquid sweet.
>
> (Italics are mine.) *Paradise Lost*, V, 18–25

English name	Scientific name	Genus	Family
Myrrh	Commiphora Myrrh Engl. (Balsamodendron Myrrh)	Commiphora	Burseraceae

Commiphora, a genus of oriental trees belonging to the family Burseaceae, and remarkable for their powerful balsamic juice. Commiphora Myrrh is a native of Arabia, Abyssinia and Samaliland, scattered among species of acasia, euphorbia, and moringa growing on rocky places especially in limestone hills.

It is a small scrubby tree, and both its wood and bark have a strong and remarkable odour. Branches are stiff, short and spiny.

Leaves are composed of tree obovate unequal leaflets, with distinct crenatures.



Fruit is a narrow, oval, furrowed plum, surrounded at the base by the persistent calyx. Flowers are unknown to botanists.

Myrrh is celebrated from all antiquity for its aromatic and fragrant properties. And in the East it is highly thought of as a perfume, medicine, embalming ingredient, incense in the temples. Also Myrrh is a natural gum-resin which is exuded from trees. It is at first soft-oily and of a yellowish-white colour and acquires the consistense of butter, and by exposure to the air becomes harder and changes to a reddish hue. Although the gum exudes naturally from the stems and branches, it will flow more freely if incisions are made in the wood.

Tracing through botanical texts and other references, it is obvious that myrrh was wildly used throughout the holy land.

Some say that Myrrh is Myrrhis odorata of Umbelliferae family.

English name	Scientific name	Genus	Family
Reed	A. donax L. (Giant reed)	Arundo (6 species)	Gramineae

The genus Arundo belongs in the grass family Gramineae. A genus of about 6 species of reed-grasses is in the warmer parts of the old world.

Only one of the genus Arundo is commonly cultivated, a giant reed, a native of the Mediterranean region now naturalized in many warm contries.

Its name (Arundo) is an ancient Latin one for this plant.

The giant reed (A. donax) is very tall grass, sends erect stems up to a height of 20 feet from knotty rootstocks. Perennials.

Leaves are gray-green, alternate, and regularly spaced in two opposite ranks that spread in the same plane. They are 1 foot to 2 feet long by 1 inch to 3 inches wide and are without hairs except for a tuft near the base of the blade.

The erect or slightly drooping, rather narrow panicles of bloom are 1 to 2 feet in length and have numerous slender branches, at first reddish then white in autumn.

Propagation is by division of the chumps, or by placing a stem in a receptacle of water and leaving it to develop new little plants, which it will do from every joint, in a short time.

The stems of the giant reed are used for various purposes, such as reed of bagpipes, clarinets, and organs, and for making screens, lattices, mats, and fishing poles, as well as for light construction.

The giant reed has a long history. It was well known to the ancients and is frequently depicted in their arts such as those that decorate the temples of Egypt. A reproduction of its flower cluster was the Egyptian hieroglyphic for the equivalent of the letter A. and some believe that our modern letter can be traced to that source. This grass grows plentifully and luxuriantly along the bank of the Nile, along the shores of the Dead Sea, and is common elsewhere in the Bible lands. Because of this, authorities believe that many references to reeds in the Bible are to this plant, but in other instances different plant, such as Typha and Phragmites, are undoubtedly indicated.

Arundos are grassed of noble appearances and well-placed clumps are striking features in landscapes.

Milton's Plants in *Paradise Lost*

English name	Scientific name	Genus	Family
Elm	Ulmus procera Salisb. (English elm)	Ulmus (elm) (45 species)	Ulmaceae

The sorts of Ulmus must be accounted among the handsomest trees native in the northern hemisphere. Belonging to the elm family Ulmaceae, there are forty-five species of elm. English elm (U. procera) is native of western Europe.

This genus has as its botanical name its ancient Latin one.

English elms are deciduous large trees. Its maximum is 150 feet tall. It has a trunk with deeply-fissured bark and usually a conspicuous growth of sucker shoots around its base.

Shoots are often corky winged and downy.

Leaves are alternate, simple, toothed, and asymmetrical at the base. They are mostly relatively small 2 to 3 inch long or sometimes longer and elliptic or ovate. Lateral-veins are 10 to 12 pairs. They have rough-short-hairy upper surfaces, and pubescent undersides with tufts of white hairs in the vein axils.

The tiny flowers, which are without display value, are bisexual. In small recemes from the leafy axils, they have a four-to-nine-lobed calyx and are without petals. There are as many stamens as calyx lobes. Bloom in spring.

The fruits are technically samaras with a usually broad, encircling wing. They are 3/4 inch across, with the seeds located well out of center and nearly touching their apexes.

Propagation is by seeds or by suckers.

These are predominantly shade trees and avenue trees. They afford no displays of flowers or fruits nor is their fall color at all outstanding. The foliage of most of them turns yellow. Much planted in the 17th and 18th centuries to form avenues in England.

So prayd they innocent, and to thir thoughts
Firm peace recoverd soon and wonted calm.
On to thir mornings rural work they haste
Among sweet dowes and flours; where any row
Of Fruit-trees overwoodie reachd too farr
Thir pamperd boughes, and needed hands to check
Fruitless imbraces: or they led the *Vine*

To wed her *Elm*;

(Italics are added.) *Paradise Lost*, V, 209-16

Cassia	Scientific name	Genus	Family
(American senna) (wild senna)	Cassia marylandica L	Cassia	Leguminosae

Cassia of the pea family Leguminosae, considered in a broad sense comprises some 500 to 600 species that some authorities favor splitting into several genera. They are wildly distributed in tropical, subtropical and temperature regions. But C. marylandica is one of two hardiest cultivated cassias. Native in moist, open woodlands and at stream sides from Pennsylvania to Iowa, Florida, and Texas (S W America). It survives as a garden plant considerably north of its native range.

In England, it was introduced from North America so long ago as 1723. The annual English summer is barely hot enough for, but it was very showy throughout the scorching days in July and August. Several groups on a hot southern slope appeare to enjoy the great heat.

Cassia is an ancient Greek unidentified aromatic plant.

C. marylandica is showy subshrub perennial species called wild senna or American senna.

From its woody root-stock it send strong, erect shoots, and attain 3 to 6 feet tall. Stems are hairless except sometimes hairy in the flowering parts. It is dying back to ground-level in winter.

Leaves are alternate and pinnate, they are usually of four to eight pairs of oblong to elliptic leaflets 3/4 inch to 2 inch long, with a tiny point at the tip of each (without a terminal leaflet).

Flowers are clear yellow, pea shaped and open in succession for a month or more in summer. The approximately 1 inch-wide flowers are in clustered racemes from the leaf axils. The more or less asynmetrical calyxes with five quite asynmetrical sepals and a corolla of five nearly equal-sized petals, five or ten stamens frequently of unequal lengths and often not at all fertile, dark purple anthers.

Up to 4 inch long by 1/3 nearly 1/2 inch wide, the seed pods are of joints (sections. each containing one seed) markedly wider than long, and thickish.

Propagation is usually by seed.

The dried leaves are sometimes used as a substitute for the common senna, but the true drug is procured from Cassia orientalis. They are occasionally sold by English druggist.

Thir glittering Tents he passd, and now is come
Into the blissful field, through Groves of *Myrrhe*,
And flouring Odours, *Cassia*, *Nard*, and *Balme*;
A Wilderness of sweets; for Nature here
Wantond as in her prime, and plaid at will
Her Virgin Fancies, Pouring forth more sweet,
Wilde above Rule or Art; enormous bliss.

(Italics are mine.) *Paradise Lost*, V, 291-297

English name	Scientific name	Genus	Family
Nard	Nardostachys Jatamansi D C	Nardostachys (2 species)	Valerianaceae

This is the spikenard of the ancients and the source of an essential oil.

Spikenard is valerian family Valerianaceae and native of the loftier regions of the central and eastern Himalayas.

Its name comes from *nardos*, the ancient Greek name of a fragrant oil derived from N. Jatamansi, and *stachys*, a spike, in reference to the arrangement of the flowers.

It is hardy herbaceous perennials with woody rhizomes and fragrant roots and undivided mostly basal leaves and small clusters of flowers.

Leaves are supplemented by a few pairs of opposite stem leaves and simple. It is oblong-lanceolate to spatula-shaped, 2 to 4 inche long, acute narrowed to a stalk.

Tiny rose-purple flowers in terminal clusters have a five-lobed persistent calyx five-lobed corolla, four stamens and one slender style. The scape is 4 inch to 1 foot tall, or sometimes taller.

Fruit is slender achenes, one seeded, crowned by persistent calyx.

The upper parts of the roots are covered with black fibrous remains of an old petioles. The bruised roots are perfume.

It is easily propagated by seed.

They are elevations of 11,000 to 17,000 feet, inhabiting stony places, and very varying

in stature and amount of odour according to the elevation. Specimen from low levels plants attaining twenty-eight inches in height, with larger leaves and flowers and faintly-scented rhizomes. While those from high attitudes are very dwarf more slender, smaller flowered, with very strongly-scented rhizomes.

Odour of the plant is heavy, but not disagreeable. In the Gospel according to St. Mark, and in according to St. John (12 : 3), we read of the annointing of Jesus in Bethany at the house of Simon the leper. In the former gospel we learn : "as He sat at meat, there came a woman having an alabaster box of ointment of spilenard, very precious, and she broke the box, and pured in on His head. And there were some that had indigation within themselves, and said, Why was this waste of ointment made? For it might have been sold for more than three hundred pence, and have been given to the poor. And they murmured against her." In Canticles i, 12 and iv, 13, spikenard is spoken of as prized for its fragrance, and a luxury for kings. In the present day, it is highly esteemed throughout the East, both as a perfume and stimulant medicine. Also it yields an essential oil. The oil is obtained from the spikes which, when ripe, are cut with a portion of the stem about 1 foot in length, and are then subjected to distillation.

English name	Scientific name	Genus	Family
Balm (Oswego tea) (Bee balm) (Fragrant balm)	Monarda didma. L	monarda (16 species)	Labiatae

Monarda belongs in the mind family Labiatae. Monarda didyma is native of North America (from Maine to Michigan and North Carolina) and quite hardy in this country. It is most abundant in moist thickets and woodlands and should be grown in a boggy soil and full sunshine.

Monarda has a name that commemorates the Spanish and botanist Nicholas de Monardes, who died in 1588. He wrote in 1571 a book on American products, afterwards translated into English.

Monarda didyma is a handsome variable perennial, herbs. It has brilliant flower and pleasing fragrant of its leaves.

This has sometimes branched stems, 2 1/2 to 4 feet tall. Stems are mostly square in cross section, and glabrous.

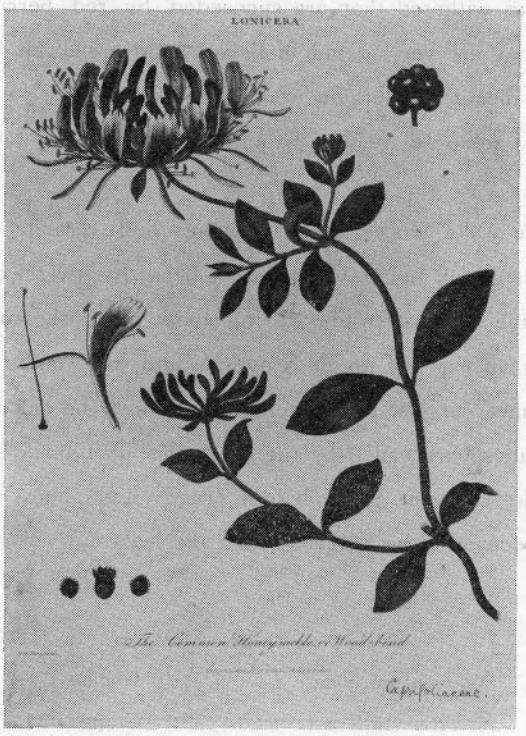
Leaves are ovate to nearly lanceolate and 3 to 6 inches long. Opposite. Sorratedentate,

sparsely pubescent, petioles over 1/4 inch long.

Flowers are showy, large and bright crimson. They are crowded in heads with bracts usually tinged red. They are arranged in whorls. Asymmetrical, narrowly-tubular flowers. 5 leafy calyx is to 1/2 inch long and tubular with 15 veins. 2-1 lipped corollas, with tubes slightly broadened toward their mouths and hairy on their outside. Corolla tubes are longer than calyx. Bloom in summer.

They are very easily increased by root division and the species by seed.

Woodbine	Scientific name	Genus	Family
(Common honey-suckle)	Lonicera periclymenum L.	Lonicera	Caprifoliaceae



Lonicera consists of 200 species as well as many hybrids and garden varieties. It belongs in the honeysuckle family Caprifoliaceae and is widely distributed as an native chiefly in the northern hemisphere.

Woodbine is one of the most fragrant kinds. It is native to Europe, North Africa, and western Asia, growing over bushes in a wild state.

Named to commemorate the German physician and naturalist Adam Lonicer or Lonitzer who died in 1856.

The word honeysuckle always suggests fragrance, for there are no flowers quite so sweet or more charming among hardy climbers.

Woodbine is a deciduous climbing shrub. This has stems 10 to 20 feet in length.

Leaves are opposite and simple, ovate to ovate-oblong or obvate up 1 1/2 to 2 1/2 inches long and two-thirds as wide. They are green above and slightly blush-glaucous on their undersides. Those of each pair are always separate, never joined at their bases.

Flowers are small but showy. They are displayed in stalked spikes of three to five whorls (circles) at the shoot ends. The more or less red-singed, yellowish-white. It had long tubular, though the bee may not reach, two lipped blooms, 1 1/2 to 2 inches long. There are 5 petals and 5 stamens.

After the blossom has withered they are succeeded by red berries. Fruits are closely clustered, globose. They are very inspid in flavour, and are eaten only by children and birds, they add to the beauty of autumn woods and hedges.

Propagation is easily achieved by seed in autumn and by leafy cuttings taken in July or August.

Their value to clothe walls, fences, arbours, arches and verandahs is too well known. But it is not too much grown being surpassed in beaty by several cultivated varieties.

Druing May and June its blossom are waving about the bushes or creeping over the old ruin or rocky crag, in all parts of united kingdom, and we wonder not that poets, both ancient and modern have sung of their sweetness. It had the old name of woodbine, but both Spencer and Shakespeare call it by the older one of Caprifole, or Goat-leaf, which was given because, like the goat, it climb over craggy and almost inaccessible places, or as some writers say because these animals relish the leaves.

English name	Scientific name	Genus	Family
Vine (European wine grape) (Common grape wine)	Vitis vinifera L	Grape (60-70 species)	Vitaceae

This belongs to family Vitaceae consisting of between sixty or seventy species, and the one dealt with here is Vitis vinifera called European wine grape or common grape wine.

European wine grape is found growing wild in the temperate regions of southeast Eu-

rope, India and parts of Africa. It is supposed to have originated in Asia Minor to the south of Caucasus and the Caspian Sea. But early they were taken first to Mediterranean land, later, as European peoples settled in other parts of the world they took with them grapes. Now they are cultivated in vast quantity in all major grape growing and wine making regions of the world. Records of its cultivation and of making of wine in Egypt go back 5000 or 6000 years.

The name Vitis is an ancient Latin one for the wine or vineyard grape of the old world (Vitis vinifera).

This is deciduous perennial shrubs, and climbing and supporting themselves by tendrils and grow so fast that they sometimes attain up to 50 or 60 feet during one season.

Shoots are glabrous. Since they are too weak to support themselves and their heavy load of grapes, they are usually held up on sticks.

Leaves are alternate, palmately 3-or 5-lobed, 4 to 9 inch wide. Coarsely toothed. Tendrils simple or branched, often coiled, slender-tipped. They may develop opposite every leaf or all except every third leaf.

Flowers are no decorative value. They are small, in panicles or racemes opposite a leaf, black with a blue or amber coloured. They have a minute five parted calyx, five petals that remain joined together and drop as a unit called a cap, five stampers. A prominent disk surrounds the ovary. Mostly they are, or behave as though they are unisexual.

Fruits (Grapes) are a globose to ovoid pulpy berry containing 2 to 4 usually pear-shaped seeds. The fruits will ripen after the beginning of September in a normal year, but for wine may be lift to get very ripe, hanging on the vines till well after the first frosts, which do not hurt the ripe grapes.

Propagation is by seeds or by hardwood cutting and by layering.

These are the grapes of antiquity of the classics, to which referrence is made in the Old Testament and the New Testament of the Bible.

Among the most important fruits grapes are much esteemed and cultivated for eating out of hand, wine making, and drying currants and raisins. They are varieties of various species of Vitis, of the grape family Vitaceae.

all in Circles as they stood,
Tables are set, and on a sudden pil'd
With Angels Food, and rubied Nectar flows

In Pearl, in Diamond, and massie Gold,
Fruit of *delicious Vines*, the growth of Heav'n
(Italics are mine) *Paradise Lost*, V, 631-35

English name	Scientific name	Genus	Family
Ivy	Hedra helix (English ivy) (Common ivy)	Hedera (4 or 5 species)	Araliaceae

five species
- Algerian ivy (H canariensis)
- Baltic ivy (H helix baltica)
- English ivy (H helix)
- Irish ivy (H h hibernica)
- Italian ivy (H h poetia)

English ivy, variable in the wild, is extremely so in cultivation, The number of horicultural varieties and the confusion of the application of names to many of them is little short of horrendous In the typical form, H helix is high-climbing vine or ground-cover with the hairs of its young shoots, leaves, and flowering parts all stellate and with four to six arms or rays

Character

Nature Europe, west Asia, North Africa, naturalized in U S

Propagated by cuttings and layers, or by seeds which usually germinate the second year. Climber up to 100 feet Evergreen climbers, attaching themselves to their support bymeans of aerial roots

Sterile Shoots 2 to 4 inch long, broadly ovate to triangular

Leaves leaves blades, are thick, leathery, dark green, and when mature, have conspic uous, raised, graish-white veins They are 3 to five-lobed with the terminal lobe about as broad as long Sometimes the two basal lobes are much reduced in size or are absent In the fertile shoot (adult phase) the leaves are without lobes and generally are wedge-shaped or at least not markedly heart-shaped at their bases Juvenile leaves, 5-lobes, 2-3 inch long, dark green veins whitish above, adult leaves, elliptic to ovate hairs with 5 or 6 rays

Fruits black (when ripened) containing 2 to five seeds globose, 1/4 wide, berry-like drupen (fruits constructed like plums).

Flowers borne in stalked umbels, the small yellowish-green flowers, favorite of bees,

inglobose umbels; 1 1/2 to 2 1/2 inch wide; five petals and stamens.

Hederas are artificially maintained as propagations of fruiting parts of vining species, evergreen vines that if given opportunity climb by attaching their stems to tree trunks, cliffs, walls, and similar supports by adventitious rootlets from the stems. With out supports they trail root into the ground two distinct stages, the juvenile in which the stems vine and no flowers or fruits are produced, and the adult, in which flowers and fruits are borne abundantly and, characteristically, the stems are neither vining nor rooting.

The jevenile stage persists for many years, commonly several decades. Indeed unless the plants have opprotunity to climb to a considerable height, it remains a stalk feature. High-climbing specimens eventually assume adult characteristics, that is, their upper parts do; the lower stems remain vinelike.

Young shoots, calyx and flower-stalks furnished with scale-like stellate hairs, with the number of 'rays' varying in different species.

In its creeping state and as long as it produces aerial roots, the ivy is quite sterile. It bears flowers and fruits only when it has reached the top of its support and ceased to climb. The leaves then become entire and to growth becomes bushy. Plants raised from these fertile growth make bushy shrubs several feet high and flower and fruit freely in that state. Such plants are generally distinguished from the creeping form as 'var. arborescens.'

Many other varieties of English ivy are grown, some primarily as indoor plants, other outdoors: are much esteemed outdoors and indoors. They are used to decorate greenhouses and farms as well as gardens. For these purposes they are admirable. Their chief, in most cases only, attraction is their evergreen foliage. The chief outdoor uses of ivies are as self-clinging climbers to adorn mansonry, tree trunks and tree stumps and as ground covers.

Thou therefore now advise
Or hear what to my mind first thoughts present,
Let us divide our labours, thou where choice
Leads thee, or where most needs, whether to wind
The *Woodbine* round this Arbour, ordirect
The clasping *Ivie* where to climb, while I
In yonder spring of Roses intermixt

With *Myrtle*, find what to redress till Noon:

(Italics are mine.) *Paradise Lost*, IX, 212-19

English name	Scientific name	Genus	Family
Apple	Malus pumila Mille (Common apple)	Malus (Apple) (Crab Apple)	Rosaceae

Apple and crab apples are among the most important and most beautiful ornamental flowering and fruiting trees of temperate climates. The genus Malus they constitute belongs to the rose family Rosaceae. It comprises thirty-five species, natives of the northern hemisphere.

In addition to the natural species, there are numerous pomological varieties (orchard apples and crab apples) and great numbers of varieties and hybrids admired for their splendid ornamental qualities. Apples are closely related to pears (Pyrus), the two being by some botanists united. The chief differences, not completely exclusive, are that the styles of the flowers of Malus are joined at their bases and that the fruits, usually apple-rhater than pear-shaped, contain few or no grit cells such as are plentiful in pears.

Crab apples are restricted to kinds with fruits under about 2 inches in diameter.

The name is an ancient Latin one for the apple.

M. pumila (syn. M. domestica) is native to southern Europe and adjacent Asia.

M. pumila is a deciduous sturdy tree 15 to 40 feet high of small, much branched tree. Wild crab: round; headed tree; buds, shoot, leaves, flower-stalks downy. This is the parent of orchard apples.

Leaves: they have alternate leaves. In the wild they have pointed, ovate to eliptic, mostly downy on their undersides: toothed green: 1 1/2 inch long.

Flowers: umbel-like racemes, pink, pinkish or white flowers in clusters of up to seven: five-lobed calyx: five obovate to nearly round petals: fifteen to fity stamens with generally yellow anthers: two to five styles, their bases joined: in April

Fruits: The freshy fruits, technically pomes, typically this has large, usually sweet fruits; flesh of fruits usually white; sub-globose yellow 1 to 1 1/2 inch wide.

Apple wood is splendid firewood. Apples are grown for fruit and as ornamentals. The most important fruit trees of cool temperate regions are the various descendents of M. pumila, the wild or original apple.

The apple, our most important hardy fruit, has been cultivated since very ancient times. Propagation is by seeds, layering, cuttings, budding grafting.

Till on a day roaving the field, I chanc'd
A goodly Tree farr distant to behold
Load'n with fruit of fairest colours mixt,
Ruddie and Gold: I nearer drew to gaze;
When from the boughes a savorie odour blown,
Grateful to appetite, more pleas'd my sense
Then smell of sweetest Fenel, or the Teats
Of Ewe or Goat dropping with Milk at Eevn,
Unsuckt of Lamb or Kid, that tend thir play.
To satisfie the sharp desire I had
Of tasting those Fair *Apples*, I resolv'd
Not to deferr;

(Italics are mine.) *Paradise Lost*, IX, 575-86

English name	Scientific name	Genus	Family
Pansy	V. x. Wittrockiana Grams.	Viola	Violaceae

V. tricolar and apparently V. lutea, together with V. altaica untill the second decade of the nineteenth century that hybridizing simple species and making selections from their offspring and then recrossing and selecting again began. The project was started by an Englishman named Thompson, gardener to Lord Gambier. Within ten or fifteen years a few hundred varieties of pansies were being cultivated. Later, French horticulturists engaged in the work and modern pansies are largely derived from the sorts they raised. And the word pansy is a modification of the French pensee, thoughts. It derives from the same Latin root as pensive. In the once popular "language of flowers" pansies mean thoughts, and so poor mad Ophelia of Shakespeare's Hamlet refers to a ancestral species as she plucks the flowers from her nosegay and says "There's rosemary, that's for remembrance: pray you love remember: and there is pansies, that's for thoughts."

The European heartsease or johnny-jump-up (Viola tricolar) provided the starting point and most important element in this breeding programme, but other species, V. lutea and probably V. altaica, were involved. To the hybrid swarm we now grow the name V. wittrockiana is applied. Except for the pretty facelike markings of most pansy flowers, it is difficult to relate these after splendid blooms 2 to 4 inches wide to the miniatures of their forebears. Modern pansies come in an extraordinary range; their rich colors and combinations including white, cream, yellow, orange-yellow, pinlike-purple, purple, blue, brownish-red, and maroon.

In all except regions of cool, humid summers, pansies are for practical purposes raised to give a fine display from the end of winter, or in warm climate during winter, untill debiltated by the stresses of late spring or early summer weather. Then they are discarded.

Quite marvelous companions for hyacinthus, tulips and other spring-flowering bulb plants, pansies are splended in patchless at the fronts of mixed flowers beds, in beds and borders interplanted with bulb plants or by themselves, and for window and porch boxes, urns, and similar containers.

Annual or short living perennial. Stems are leafy, much branched 4 to 9 inch high, lower leaves are ovate and subcordate. Upper leaves are lanceolate-elliptic and cuneate at base. Flowers are very large to 2-5 inch across, rounded in outline, flattened various coloured.

Pansy is usually projected by seeds.

Her hand he seis'd, and to a shadie bank,
Thick overhead with verdant roof imbowr'd
He led her nothing loath; Flours were the Couch,
Pansies, and *Violets*, and *Asphodel*,
And *Hyacinth*, Earths freshest softest lap.
(Italics are mine.) *Paradise Lost*, IX, 1037-41

English name	Scientific name	Genus	Family
Asphodel	Asphodelus cerasiferus J. Gay (Asphodelus ramosus L.)	Asphodelus (10-15 species)	Liliaceae

Asphodelus belongs in the lily family Liliaceae and comprises 10 to 15 species, the best known of which is A. cerasiferus is a native of the western Mediterrenean region (Portugal, Spain, S. France, Corsica, Baleric Is.) Here, these plants are extremely abundant and so much wind-swept, that are of inconsiderable height.

The name Asphodelus is an ancient Greek one of unknown significance.

A. cerasiferus is deciduous herbaceous perennials, the tallest of the asphodels, 4 to 5 feet high and basal.

Leaves are sword-shaped, stiff, sharply keeled, channelled above, radical tufted, to 14 inch long.

Flower stems are devoid of leaves. Racemes very long, dense, bearing numerous white flowers, being 3/4 to 1 inch long. Funnel-shaped folwers, with six perianth equal spreading segments. Segments, with a reddish-brown keel, united and dilated at base. Stamens are all of the same length(6), bracts ovate to lanceolate. Bloom in summer.

Fruits are over 1/2 inch long, capes subglobose.

Roots are fleshy, tuberous.

Propagation by seeds or division in early spring.

It is of easy culture in the open, in the border, but better fitted for the shrubbery or wild garden.

In English gardens we [the British people] have nothing of this. Our sun is not sufficiently hot to bring out its positions, quality, and it does not overrun with its seedlings very rich of ground that is left untilled.

Its foliage is poisonous to animals even when dry, and its scent is so harmful when in fower, that a Corsican prefect who ordered it to be nown down as an experiment was oblized to give up his benevolent idea, the mowers were all made so ill from its scent.

Englsh name	Scientific name	Genus	Family
Fig	Ficus carica	Ficus	Moraceae
(Common fig)		(800 species)	

The remarkable and extensive genus Ficus includes 800 species, belongs to the mulberry family Moraceae, almost all containing milky sap. Most familiar is the common edible fig (Ficus carica). This genus is kin of sage-orange and nettles.

Native is Western Asia. Its wild habit probably extending from Syria and E. Persia to Afghanistan. It has been grown for its fruit from remote antiquity and early spread

widely through the north warm temperate and sub-tropical regions to China, where, according to Bretschneider, it was grown at least as early as the latter half of the 14th century. Its name is an ancient Latin one.

The Fig produces 2 or, in some climates, 3 crops in the year and the fruit crop thus extended is an important article of food in the East, both in a fresh and in a dried state. Dried figs are also exported in great quantities from the countries where favourable conditions for the production of 3 cropos occur. The fresh fruit remains in good condition for a very short time and this combined with its extremely tender skin, renders it among the most difficult of fruits to pack to travel any great distance, and it is thus not in any general favors as an article of commerce.

Common fig is a broad irregular deciduous shrub or tree 15 to 30 feet tall with milky sap. Despite their different habits of growth, all figs remarkably alike in their floral structures. Leaves—their roughish deeply-three-to-five lobed leaves form attractive patterns, rough above, downy beneath.

The structures commonly called fruits, are not fruit in the botanical sense. Morphologically they are large fleshy receptacles formed into hollow vessels with tiny flowers and later true fruit (the seeds as they are generally called) inside.

The only significance of this, from the growers' point of view, is that some kinds don't develop sizable, edible fruits unless the flowers are cross fertilized by pollen from a special kind of fig called a caprifig, and this is done only by a tiny gall-wasp that live for parts of its life in the fruits of caprifig. The process of pollen transfer is called caprification.

Each receptacle has a tiny aperture at its end protected by small overlapping bracts. There are three types of flowers. Flowers monoecious growing on the inner surface of a hollow fleshy receptacle having at the tip an orifice closed by amall scales: in the upper parts—male; lower female.

Flowers of three types: fertile males
fertile females
sterile females called gall flowers

The procedure can best be made clear by explaining that the gravid female insect enters the receptacle through the aperture at its apex and lays eggs on the ovaries of the flowers. The male insects of the resulting progeny fertilize the females of the same broad without leaving the receptacle.

After mating, the males die, but the fertilized females escape through the opening at the end of the receptacle and as they emerge are dusted with pollen from male flowers

crowded around the exit. This they carry to the female flowers in the receptacles they select as repositories for their eggs. When the eggs hatch the grubs of the gall wasps feed on the endosperm of the gall flowers. Between insects and plants there is a mutually advantageous relationship, the insects pollinate the flowers, the flowers supply nourishment to the larvae of the insects.

The fruits are produced 1 or 2 together, in the axilas of the leaves and are formed along the shoot as growth proceed. Figs are remarkably alike in their floral structures which is the basis for plant classification. The tiny, petalless flowers are attached on the inside of hollow, globular or pear-shaped receptacles that are mistakenly called fruits (the true fruits are the seeds that develop inside the swollen receptacles but here we shall follow the common and convenient practice of referring to the receptacles themselves as fruits).

Figs are exacting in their climatic needs, to the extent that commercial production is limited to comparatively few regions where winters are mild, summers not excessively hot, wet or humid, and destructive winds are generally not experienced or shelter from them is provided.

Its habits of growth vary, it can crawl like a climber or be a good sized tree in it own right, when it can be enjoyed for its shade. (Some may have seen no more than straggly shrubs sprawling from their roothold in stony areas or rocky walls. In more favored growing situations fig trees may grow 20~30 feet tall.)

The fig tree of the Holy land produces its crops in a short two month season—in some cases two crops a year. It is the first plant to be mentioned by name in the story of the aprons made from fig leaves in the Garden of Eden (Matt. 24:32, 21:19, Genesis 3:7, Micah 4:4, Proverb 27:18, Joel 2:21-22, Isaiah 36:16). Through the ages, figs were prized food among the Greeks and Romans too. Propagation is easy by seeds and cutting.

The Hebrew word for the fig tree is "Teenah" meaning "spread out."

So counseld hee, and both together went
Into the thickest Wood, there soon they chose
The *Figtree,* not that kind for Fruit renownd,
But such as at this day to *Indians* known
In *Malabar* or *Decan* spreads her Armes
Braunching so broad and long, that in the ground

The bended Twigs take root, and Daughters grow
About the Mother Tree, a Pillard shade
High overarcht, and echoing Walks between;
There oft the *Indian* Herdsman shunring heate
Shelters in coole, and tends his pasturing Herds
At Loopholes cut through thickest shade :
(Italics are added.) *Paradise Lost*, IX, 1099-1110

English name	Scientific name	Genus	Family
Banyan tree (East indian fig tree) (Indian banyan)	F. benghalensis L.	Frucus	Moraceae

The banyan is held sacred by the peoples of India. Hindus believe that Brahma, the Creator, was transformed into a banyan tree.

In New Delhi and elsewhere they are used as a street trees. Believers will not prune or cut down a banyan. That work, when necessary, is done by others.

Native of tropical Asia, and India. Widely cultivated in tropics zone.

The banyan (F. benghalensis) is a magnificient evergreen, sometimes 100 feet in height. Like so many figs it begins life as an epiphyte, but once establsihed in the ground its massive limbs spread horizontally and as they extend send down roots that develop into secondary, pillar-like supporting trunks. Over a period of years a single tree may come to occupy a tremendous area. One famous specimen near Poona in India spread so widely that its periphery measured 2,000 feet and it was estimated that it could shelter 20,000 people.

Leaves: the sparsely-veined, ovate to elliptic; up to 10 inch long by a little over one half as wide; sometimes minutely downy beneath.

Fruits: globose, red; borne in pairs; about 3/4 inch in diameter (as large as cherry); sessil.

English name	Scientific name	Genus	Family
Common cotton thistle (Scotch thistle)	Onopordum acanthium L.	Onopordum	Compositae

It belongs to Compositae, most likely species to be cultivated. Biennial.

Native is Europe, including Britain, Siberia, and naturalized over much of North America.

Its name (Onopordam) is a Latinized form of the old Greek name onoporde.

Scotch thistle is vigorous and bold, 3 to 9 feet tall, much branched. This is covered with white-cottony hairs.

Leaves are oblong to ovate, lobed, prickly-toothed, up to 1 foot in length.

Flowers are large, head purple, involucral bracts awl-shaped, spreading. July.

English name	Scientific name	Genus	Family
Globe thistle	Echinops viscosus L.	Echinops (75 species)	Compositae

Echinops belongs to the Compositae, and has 75 species. Native is Greece and E. Mediterranean.

Its name (Ethinops) comes from the Greek *echinos*, a hedgehog, and *ops*, appearance, in allusion to the flower heads.

Globe thistle is clammy hairy perennial, stem tall, branched.

Leaves are alternate, pinnately cut, the lobes lanceolate, spiny, green above, ash-grey beneath.

Flowers are large globose head, (numerous—1 flowered heads), head pale blue. June to August. The tiny florets are technically solitary and each has an involucre of little bracts, but they are crowded into dense spherical heads, usually called flowers, with at the base of each a common involucre of reflexed bracts.

Fruits are seedlike achenes.

The flower heads of globe thistle can be cut and used in dried arrangements.

English name	Scientific name	Genus	Family
Thistle (Our Lady's thistle) (St. Lady's thistle) (Blessed thistle) (Holy thistle) (Milk thistle) (St. Mary's thistle)	Silybum Marianum	Silybum (2 species)	Compositae

This of two species belong in sylibum, daisy family compositae.

Native is Mediterranean region. Since this plant is common in the Holy land, it is considered to be one of the several species included in the biblical meaning of the word thistle.

The name (Silybum) is an ancient Greek one used by Dioscarides for some thistle like plant.

This plant has beautiful foliage and quite showy flower heads. Bienniel herbs. It forms rosettes of basal leaves from which rise branching, leafy flower stalks to a height of 3 or 4 feet.

Leaves are large alternate, conspicuously spotted or marbled with white, lobed spiny-toothed. Glossy-green leaves.

Flower heads are terminal, fairy fragrant, rose-purple, globose, 1 to 2 inch across, involucred bracts leathy, closely oppressed, with 1 very stout, terminal spine, receptacle hairy, not pitted, fleshy. July to September.

Fruits achenes.

Thou shalt not eate thereof,
Curst is the ground for thy sake, thou in sorrow
Shalt eate thereof all the days of thy Life;
Thorns also and *Thistles it* shall bring thee forth
Unbid, and thou shalt eate th' Herb of the Field,
In the sweat of thy Face shalt thou eate Bread,
Till thou return unto the ground, for thou
Out of the ground wast tak'n: know thy Birth,
For dust thou art, and shalt to dust returne.

(Italics are mine.) *Paradise Lost*, X, 200-208

Englsih name	Scientific name	Genus	Family
Olive (Common olive)	O. europaea L.	Olea (20 species)	Oleaceae

The genus olea, of the olive family Oleaceae, contains twenty species. It is widely distributed as a native of the eastern hemisphere.

The most important species of the genus, the common olive (O. europea) is widely grown in Mediterranean-type climates everywhere for its fruits, which are greatly esteemed for food and as a source of oil. And there, it forms one of the most characteristic features of the landscape, and on the slopes of many of the mountains is the principal forest trees. Since time immemorial this species has been so cultivated.

Common olive is believed to be a native of Asia Minor. It was introduced from the area of its provenance to other lands bordering Mediterrenean by the Phoenicians, Greeks, and Romans and since has become enormously important to the agricultural and horticultural economies of the region. Later it was transported further afield and is now extensively cultivated.

Its name (Olea) is the classical one of the common olive.

Round-headed much branched evergreen trees, 20 to 40 feet high. Old specimens are decidedly picturesque. It is extremely long-lived, its possible life span certainly being in excess of 1000 years. Their trunks, frequently twisted and gnarled are often hollow.

Leaves are opposite, leathery, narrowly elliptic, oblong or lanceolate. 1 inch to 3 inch long, 1/3 to 3/4 inch wide. Upper surfaces are dark gray-green. Undersides are glaucous-white.

Little white flowers are in panicles from the leaf axils. 1 to 2 inch long. Panicles shorter than the leaves. Fragrant. July, August. They have a short, four-toothed calyx, a corolla with a short tube and four spreading lobes (petals) two stamens, and a short style.

Fruits are oily drupes (fruits of plumlike structure), are the familiar olives of commerce. Oval, with 1 hard seed. They are green at first, becoming black and glossy when ripe, and 1/2 inch to 1 1/2 inch long.

The oil is obtained by pressure from the pulp of its fruit.

Propagation is by seed and cuttings.

One of the world's most important sources of edible oil. In some countries oil forms an important article of food, besides being extensively used in cooking other articles. In this country (U. K.) it is principally used in salads. Olive for pickling consists of unripe fruits deprived of some of their bitterness by being soaked in water to which lime and wood ashes are sometimes added. They are then bottled in salt and water and flavoured with spices.

Because of its attractive silvergrey foliage, and their often picturesque forms and some for the fragrant flowers, the olive tree is also ornamental and is often seen planted as a

street tree and in the mixed plantings.

Olive-branches have for ages been regarded as emblem of peace and plenty.

Forthwith from out the Arke a Raven flies,
And after him, the surer messenger,
A Dove sent forth once and agen to spie
Green Tree or ground whereon his foot may light;
The second time returning, in his Bill
An *Olive* leafe he brings, pacific signe;
(Italics are mine.) *Paradise Lost*, XI, 855-860

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